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and had absorbed much of the cerebrum and the upper part of the cerebellum, the outlines of the Arbor Vitae being plainly visible. I have never seen anything like this in any other bird, nor have I seen any account of worms being found parasitic in the brain before. G. H. FRENCH.

Carbondale, Ill.

Epidemic Forms of Mental or Nervous Diseases or Disorders.

IN response to the inquiry concerning "epidemic forms of mental or nervous diseases or disorders," in the issue of May 19, I send the following account of an incident which "came to pass" under my own eyes. Several years ago our next-door neighbor's little girl, perhaps five or six years old, met with an accident which rendered it necessary that she use a crutch. Another little girl of about the same age, who lived in the adjoining house, seeing the little lame girl with her crutch, obtained a stick which she used as a crutch, hopping and limping, just as she saw the little lame girl doing. At first no attention was paid to this childish fancy, this imitation, this "playing being lame." After some days had elapsed, however, and this play became so constant as to be annoying, the stick was taken away, and the little girl told to put her foot to the floor. She screamed and cried and insisted most strenuously that she could not put her foot to the floor: she could not stand upon it, etc. I cannot say how long she persisted in thinking she was lame, but shall never forget how real her apparent affliction was to her, nor her screams of pain when she declared she could not stand without her "crutch" MRS. W. A. KELLERMAN.

Columbus, O.

The Winter of 1709.

"IN the famous winter of 1709 thousands of families perished in their houses, the Arabic Sea was frozen over, and even the Mediterranean."

The above is found in a foot-note on page 39 of Professor Meech's article on the intensity of the heat and light of the sun at different latitudes, published in one of the "Smithsonian Contributions to Knowledge." It seems incredible The "Arabic Sea," I take it, is what we call the Arabian Sea, or at least some one of the bodies of water which border on the Arabian peninsula. No information is given as to where the "thousands of families perished with cold in their houses."

The Arabian Sea measures about 500 miles across its narrowest part. Can it be possible that it was frozen over? or the Red Sea? or the Persian Gulf? or the Gulf of Oman? Has the Mediterranean Sea been frozen over either in historic, or even in glacial times?

The statement in Professor Meech's paper is made unequivocally, as if speaking of a well-known and well-established fact. It is not put in quotation marks, nor is any authority cited.

A few weeks ago I wrote to Professor Langley, secretary of the Smithsonian, asking for any information which he might be able to give me To-day I received the following reply:—

"I beg to say that I do not know the original source from which his particular statements were derived, but that the winter in question was one of exceptional severity is fully attested by well-authenticated records.

"Under the article 'Temperatur,' in Gehler's 'Physikalisches Wörterbuch,' it is stated that at Paris the thermometer fell many times to − 19° C.; that in the Kleiner Belt of the Danish seas the ice extended so far from the coast that the end of it could not be seen from the highest towers; and that the cold must have been especially intense in southern Germany and Italy, since the Adriatic Sea was wholly covered with ice.

"Additional records of this severe winter will probably be found in the memoirs of E. Brückner, who has been making an extended study of variations in climate."

There is nothing in the fact that at Paris the thermometer fell to − 19° C., or 3½° below our zero, nor that in the Danish waters ice formed far out from the coast to compare in any way with the freezing over of "the Arabic Sea or the Mediterranean!"

The fact — if it be a fact — that the Adriatic Sea was wholly covered with ice would indeed be very remarkable, but even that was a small affair (indicating a moderate climatic aberration) in comparison with a temperature so abnormally low as to freeze over so large a body as the Mediterranean, or one so large and so exceptionally warm as the Arabic Sea.

Can any reader of *Science*, or any one else, throw any light on this subject? C. B. WARRING.

Animal Effigies.

CAN you or any of your readers furnish me with a reference or references as to large numbers of small animal effigies of pottery found together in any mound of the United States?

C. B. M.

BOOK-REVIEWS.

The Moon's Face: A Study of the Origin of its Features. By G. K. GILBERT. 52 p. Washington, April, 1893.

THE present paper, although delivered as the presidential address before the Philosophical Society of Washington last December, has only recently been distributed in its complete form. Mr. Gilbert is well known as a geologist and a student of topographic form, and in this paper he has carried his studies away from things terrestrial and turned his eyes and his attention for a time to things celestial. The observations upon which the paper is based were made during three months of the past year. eighteen nights being available for the work, and the 26½-inch refractor of the U. S. Naval Observatory being the instrument employed. Numerous laboratory experiments were also carried on, and the literature relating to lunar topics was searched. The craters, as the most conspicuous features of the moon's face, are mainly dealt with in the paper, and after a description of their characteristics and a statement of the various theories advanced to account for them, the author advances a theory of his own. The volcanic theory is one held by many writers, but a comparison of terrestrial and lunar craters, even when the differences in condition are considered, led Mr. Gilbert to reject the hypothesis as untenable. The "bubble" theory, advocated by Robert Hooke in his *Micrographia*, in 1667, is mentioned, but as Mr. Gilbert had not seen the book the theory is not discussed in any detail. It may not be amiss to devote a few words to it here.

Hooke describes the features of the craters as he saw them through his telescope, and gives an illustration of some of them. Except as regards detail and the characteristic central hill shown in Mr. Gilbert's figures, those given by Hooke are very similar. In describing the craters he says: "These seem to me to have been the effects of some motions within the body of the moon, analogous to our earthquakes, by the eruption of which, as it has thrown up a brim or ridge round about higher than the ambient surface of the moon, so has it left a hole or depression in the middle, proportionally lower." He also mentions, what is of more interest, that he had made several experiments to ascertain, if possible, the origin of the pits. "The first was with a very soft and well-tempered mixture of tobacco-pipe clay and water, into which, if I let fall any heavy body. as a bullet, it would throw up a mixture round the place, which for a while would make a representation not unlike these of the moon, but considering the state and condition of the moon, there seems not any probability to imagine that it should proceed from any cause analogous to this; for it would be difficult to imagine whence those bodies should come; and next, how the substance of the moon should be so soft; but if a bubble be blown under the surface of it, and suffered to rise and break; or if a bullet or other body sunk in it be pulled out from it, these departing bodies leave an impression on the surface of the mixture exactly like those of the moon, save that these also quickly subside and vanish. But the second and most notable representation was what I observed in a pot of boiling alabaster, for then that powder being by the eruption of vapors reduced to a kind of fluid consistence, if, whilst it boils, it be gently removed beside the fire, the alabaster presently ceasing to boil, the whole surface, especially that where some of the last bubbles have risen, will appear all over covered with small pits exactly shaped like these of the moon, and by holding a lighted candle in a large dark room, in divers positions to this surface, you may exactly represent all the phenomena of these pits in the moon, according as they are more or less inlighted by the sun." He then goes on to advocate the second theory, and concludes finally that the craters had their origin similar to those formed in the alabaster.

A "tidal" theory, which supposes a time when a thin crust concealed a liquid beneath, which was moved by the action of tides in such a manner as to produce craters, is also examined and rejected by Mr. Gilbert. So also is a "snow" theory, and then are considered the "meteoric" theories, which suppose the pits to have been caused in some way by the impact of extra-lunar bodies. As we have seen, this theory was considered and rejected by Hooke in 1667, but others have not seen the same difficulties that he did. Mr. Gilbert advances the following theory:

"It is my hypothesis that before our moon came into existence the earth was surrounded by a ring similar to the Saturnian ring: that the small bodies constituting this ring afterward gradually coalesced, gathering first around a large number of nuclei, and finally all uniting in a single sphere — the moon. Under this hypothesis the lunar craters are the scars produced by the collision of those minor aggregations, or moonlets, which last surrendered their individuality."

This hypothesis was tested in numerous ways, and it was found

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CALENDAR OF SOCIETIES.

Philosophical Society, Washington.

May 27. — S. P. Langley, On Recent Observations in the Infra-red Spectrum; G. K. Gilbert, The Average Temperature of the Earth; Cleveland Abbe, The Formation of Rain.

Chemical Society, Washington.

Apr. 13.— Subject for discussion: Organization as a Section of the American Chemical Society; G. L. Spencer, A New Drying Oven. The walls of the oven are made double and the space between them filled with a non-conducting substance. The bottom of the oven is also made double, the outer wall being made of Russia iron and the inner of copper. The space between is filled with air. This oven has lately been devised in Dr. Peale's laboratory by Dr. G. L. Spencer. The drying bulbs are made in the shape of a flask with rounded bottom. The content of the flask varies from 150 to 200 cubic centimetres. From six to eight of these drying flasks are connected *en batterie* with the pump. If a current of hydrogen is to be introduced into the drying flask, it is easily accomplished by passing a very small glass tube through the cork, joined to another tube by a rubber connection immediately below the cork. The inner tube should pass nearly to the bottom of the flask, passing through a wash bottle containing caustic soda, and then through a sulfuric acid bulb. The speed of the current, which need not be very great, is controlled by a stop or pinch-cock. Any of the sample which may touch the inner tube during the intumesence, caused by desiccation, remains thereon and is weighed at the end with the tube, which is detached and left in the drying bulb. H. W. Wiley, A New Lamp for Securing a Constant Monochromatic Flame. This lamp was devised to secure a constant uniform coloration for polarimetric observations. It consists essentially of two wheels with platinum gauze perimetres and spokes, driven by a clock-work and mounted as shown in the figure. The sodium salt, chlorid or bromid, is saturated in solution, is placed on the porcelain crucibles to such a depth that the rims of the platinum wheels dip beneath the surface as they revolve. By means of the crossed bands the wheels are made to revolve in opposite directions, as indicated by the arrows. The solution of the salt, which is taken up by the platinum net-work of the rim of the wheel, thus has time to become perfectly dry before it enters the flame, and the sputtering, which a moist salt would produce, is avoided. At every instant, by this arrangement, a minute fresh portion of salt is introduced into the flame, with the result of making a perfectly uniform light, which can be used for hours without any perceptible variation. The polariscope should be so directed toward the flame as to bring into the field of vision its most luminous part. The platinum wheels are adjustable, and should be so arranged as to produce between them an unbroken yellow flame. H. B. McDonnell, A Filter for Fine Precipitates. To prepare the ordinary Gooch filter for the retention of fine precipitates, the writer adds a little powdered asbestos on top of the ordinary asbestos felt in the bottom of the perforated crucible. The fine asbestos can be purchased from dealers in chemicals, and should be an impalpable powder. It is prepared for use by treating with acid, to remove all soluble matter, and washed a few times by decantation. It is kept in water, in which it is suspended, by agitation, just before use. A filter prepared in this manner will perfectly retain barium sulphate, even when it is precipitated cold and filtered at once.

May 11. — The society amended the constitution and by-laws so as to conform it to the requirements of the constitution of the American Chemical Society, in order to become a local section of that society. Oma Carr, The Predominant Organic Acid in Acid Juices. A tenacious, difficultly soluble incrustation forming upon the tubes of the multiple-effect evaporator at the Medicine Lodge Sugar Works, Medicine Lodge, Kansas, was examined, first with regard to the practical problems connected with its removal, and, second, with regard to its composition, particularly the organic acid in combination with the magnesium and calcium of the scale. The incrustation contained a high percentage of organic matter — 54.4 per cent, of which 43.5 per cent was carbon, or 23.7 per cent on the original material. Sulfuric and acetic acid digestions of the scale were made, the magnesium salt of the prevalent organic acid isolated and converted into a repeatedly purified lead salt. Combustion of these salts rendered results concordant with the theoretical composition of tri-plumbic citrate. Aqueous solution of the acid gave reactions confirmatory of the combustions. Inasmuch as the scale may be taken as an index of the predominant acid combined with the magnesium of the scale, the assumption is plausible that the predominant acid is citric, and not aconitic, as has been commonly supposed. H. W. Wiley, On the Estimation of Levulose in Honey. The principal methods of estimating levulose in the mixtures heretofore practised are those which consist in the destruction of some of the ingredients in the mixture and the estimation of the remaining one, or the method of Wiechmann, which consists in the estimation of the polarizing and reducing power before and after inversion. Neither of these methods can be applied to honey, which contains other optically active bodies besides cane-sugar, levulose, and dextrose. The method presented rests on the principle of the change in the specific rotatory power of honey, due to temperature; the other optically active bodies present remaining practically unchanged, as far as specific rotatory power is concerned, with changes of temperature. Polarizations of many samples of honey were made at intervals of 10 from 0 to 88. The temperature at 88 was chosen as the maximum temperature, because at that temperature a pure invert sugar, composed of equal parts of levulose and dextrose, becomes optically inactive. In other words, the specific rotatory power of levulose at 88 is the same as that of dextrose. A chart was shown giving a graphic representation of the changes in rotatory power, due to temperature. The chart shows that from 20 to 88 the changes are practically equal for either increments or decrements of temperature. From 20 to 0 there is a slight curve, showing a small deficiency in rotatory power at 0 from that which would be calculated from the rate of change from 88 to 20. A table was shown giving the results of the calculation of the per cents of levulose in various samples of honey by this method, which were very satisfactory.

Reading Matter Notices.

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to agree with most of the features of the moon. We cannot, however, enter into further details or explanations that are given of various other objects, interesting though they be. We can only quote one of the concluding paragraphs, as this gives some idea of the difference in conclusions which result from the study when compared with those of other authors. He says: "This sketch of the life of our nearest neighbor has but little in common with the accounts of other biographers. To her has been ascribed a fiery youth, after the manner of the sun, a middle life of dissipation, like Jupiter and Saturn, a hardening and wrinkling old age, toward which the earth is tending, and finally, the end of change—death. If the record of her scarred face has now been read aright, all that remains of the old narrative is the *denouement*: the moon is dead." JOSEPH F. JAMES.

The Mineral Industry. Its Statistics, Technology, and Trade, in the United States and other countries from the earliest times to the end of 1892. Vol. I. Edited by Richard P. Rothwell. New York, The Scientific Publishing Company. 1893. 628 p.

IN the years of 1874–75 and '76 *The Engineering and Mining Journal* of New York published the first complete reports of the coal production of the United States, and in 1889 as special government agent for the census, the editor of the journal, Mr. Richard P. Rothwell, collected the statistics of gold and silver. The scope was gradually extended until in January, 1892, a magnificent volume of statistics was given to the world and universal encomium heaped upon the journal and its staff for their wonderful work. Indeed such was the unstinted praise accorded it we can but wonder what language will be used for the present volume, no longer a supplementary number in journal form, but a handsome library volume of 628 pages. It is the intention to make this the first of a series to embrace within a few years the statistics and technology of the mineral interests of the world, in many cases going back historically to the earliest times and always carried down to the date of publication. Such a vast undertaking has heretofore been considered impracticable for private enterprise and has been relegated to the unlimited resources of governments, it is worthy to note, however, that simultaneously with the issue of this volume containing all statistics accurately and systematically recorded for 1892, there appears the government publication of similar character for the year 1891. The introduction to this latter volume, by the way, speaks of "the impossibility of concluding a complete canvas of the products of huge industries like coal, iron ores, and building stone without a considerable delay after the close of the year reviewed," and yet the *Engineering and Mining Journal*, depending entirely upon personal courtesy and confidence for its success, has accomplished this feat so impossible to the expensive machinery of government. The journal is fortunate in possessing a large and carefully trained staff, and in being in communication with experts in all branches of industry the world over, but more than this is needed, and much praise is due to all connected with the enterprise. Especially is praise due to Mrs. Sophia Braeunlich, that able financier and business manager of *The Engineering and Mining Journal*, and to Mr. Richard P. Rothwell, editor of both journal and "statistics."

To attempt even a running review of this work would be out of the question, the table of contents alone occupying ten pages of small print. Suffice it to say that without exception the articles therein contained are written by men pre-eminently fitted for their best treatment, and in all cases by experts in each particular line. Among the contributors are: Dr. George Lunge, Dr. Francis Wyatt, author of "The Phosphates of America"; E. O. Leech, Director of the U. S. Mint; Professor J. F. Kemp, George F. Kunz, J. Langeloth, Dr. Thomas M. Chatard, Richard E. Chism, H. O. Hofman, Emile Delecroix, and many others of equal fame. They have been well chosen, and we congratulate them upon the part they have played in this most admirable work. C. P,

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The Rev. A. C. Waghorne, New Harbor, Newfoundland, wishes to sell collections of Newfoundland and Labrador plants, all named by competent botanists. He is going on a missionary journey along the Labrador coast, from the middle of July till October, and in return for much needed aid towards (Episcopal) Church purposes in that region, will be glad to be of service to any botanists who may write to him. Letters posted in the U. S. up to July 1 will reach him at the above address, and if posted later will be forwarded.

For sale.—J. D. Dana's Report on Crustacea of the U. S. Exploring Expedition under Charles Wilkes. Text and plates well bound in three volumes, half morocco, $75. Samuel Henshaw, Boston Society of Natural History, Boston, Mass.

For exchange—I wish to exchange cabinet skins of Californian birds or mammals for any book on the following list, books if second-hand to be in good order. Manual of Vertebrates, fifth edition, D. S. Jordan; Nests and Eggs of North American Birds, Oliver Davie; Marine Mammals of the West Coast of North America, C. M. Scammon; The United States and Mexican Boundary Survey, Vol. II., Zoology, S. F. Baird. F. Stephens, Witch Creek, San Diego Co., Cal.

Minerals for exchange—John Holl. Rollo, Wilmington, Delaware.

For sale or exchange.—Johnson's Universal Cyclopædia, 8 vols., ed. 1888. Binding, half-morocco. Will sell cheap for cash or would exchange for typewriter. Address W. J. McKom, Mason, Mich.

I have 500 microscopic slides to exchange in lots to suit. Want Kodak, first-class field-glass or scientific books. A. C. Gruhlke, Waterloo, Ind.

Texas Plants. I will collect sets of plants represented in this region of Texas, either for sale or for exchange for literature, for anyone who will send me an order in time to fill it. Plants to be ready complete in November. C. F. Maxwell, Box 174, Dublin, Texas.

For sale or exchange—A Telescope (36 diameters, copper barrel)—for $20 cash or scientific books of that value. A. N. Somers, La Porte, Ind.

For sale—A complete set of the Reports of the Second Geological Survey of Pa., 1874–1893, including the Grand Atlas. Publisher's price over $115. Will sell for $50. Address F. D. Chester, Newark, Del.

Wants.

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WANTED, as principal of a flourishing technical school, a gentleman of education and experience who will be capable of supervising both mechanical and common school instruction. Special familiarity with some technical branch desirable. Address, giving age, qualifications, etc., J. B. Bloomingdale, Fifty-ninth street and Third avenue, N. Y.

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A COMPETENT TEACHER of botany in college or university is open to engagement. Address L., Box 86, Rochester, Mich.

CAN any one inform me as to the age to which cats have lived? I have one twenty years old. Edward D. Webb, 132 W. Eighty-first St., New York.

WANTED—Second-hand. Foster's Physiology, Balfour's Comparative Embryology, Claus & Sedgwick's Zoology, Flower's Osteology of Mammalia, Vine's Physiology of Plants. Please state editions and prices asked and address Richard Lees Brampton, Ontario, Canada

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